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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/916,316	07/30/2001	Minoru Waki	010974	8006

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EXAMINER

SHOSHO, CALLIE E

ART UNIT PAPER NUMBER

1714

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Please find below and/or attached an Office communication concerning this application or proceeding.

mk-5

Office Action Summary	Application No.	Applicant(s)	
	09/916,316	WAKI ET AL.	
	Examiner	Art Unit	
	Callie E. Shosho	1714	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3-4. 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 3-7, and 10-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Zhu (U.S. 5,889,083).

Zhu discloses ink jet ink comprising water, solvent, pigment, acetylene glycol surfactant corresponding to presently claimed formula VI, penetrating agent such as ethylene glycol ethyl ether, and one or more binders which each have acid number of 20-500 and which include styrene-maleic anhydride and polymer obtained from methyl methacrylate, butyl acrylate, and acrylic acid. The ink is used in an ink jet printer to produce printed substrate. Although styrene-maleic anhydride and methyl methacrylate/butyl acrylate/acrylic acid polymer are referred to as binders and not dispersants, given that the polymers are identical to those presently claimed, it is clear that these “binders” would inherently function as dispersants (col.3, lines 15-23 and 27, col.4, lines 34-38, col.5, lines 1-4, 15-16, 21, and 27, col.5, line 56-col.6, line 9, col.8, lines 56-65, col.9, lines 10-17, and col.10, lines 31-44).

In light of the above, it is clear that Zhu anticipates the present claims.

3. Claims 1 and 10-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Anton et al. (U.S. 6,005,023).

Anton et al. disclose ink jet ink which comprises water, solvent, pigment, surfactant, 0.1-25% dispersant which is obtained from methyl methacrylate, alkyl acrylate, and acrylic acid and 0.1-20% emulsion polymer additive obtained from styrene and maleic anhydride. The ink is used in ink jet printer in order to produce printed substrate. Although there is no disclosure that styrene-maleic anhydride functions as a dispersant, given that the polymer is identical to that presently claimed, it is clear that the styrene maleic anhydride would inherently function as a dispersant (col., 2lines 10-11 and 30, col.3, lines 13-20 and 53-62, col.4, lines 10 and 28-30, col.5, lines 44-45 and 53-54, and col.6, lines 45-50 and 54).

In light of the above, it is clear that Anton et al. anticipate the present claims.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.

3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
5. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Anton et al. (U.S. 6,005,023) in view of Ma et al. (U.S. 5,648,405).

The disclosure with respect to Anton et al. in paragraph 3 above is incorporated here by reference.

The difference between Anton et al. and the present claimed invention is the requirement in the claims that styrene-maleic anhydride and methyl methacrylate/butyl acrylate/ acrylic acid polymer are random copolymers.

Ma et al., which is drawn to ink jet inks, disclose that it is well known in the ink art to use polymer dispersants having random structures and that such dispersants are effective as well as easy and cheap to produce (col.1, lines 57-65).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use styrene-maleic anhydride and methyl methacrylate/butyl acrylate/ acrylic acid polymer with random structure in the ink of Anton et al., and thereby arrive at the claimed invention.

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Anton et al. (U.S. 6,005,023) in view of Zhu (U.S. 5,889,083).

The disclosure with respect to Anton et al. in paragraph 3 above is incorporated here by reference.

The difference between Anton et al. and the present claimed invention is the requirement in the claims of surfactant of presently claimed formula VI, i.e. acetylene glycol.

Zhu, which is drawn to ink jet inks, disclose the use of acetylene glycol in order to prevent foaming of the ink during preparation as well as printing (col.10, lines 12-18 and 31-44).

In light of the motivation for using specific surfactant disclosed by Zhu as described above, it therefore would have been obvious to one of ordinary skill in the art to use such surfactant in the ink of Anton et al. in order to prevent ink from foaming during preparation and printing, and thereby arrive at the claimed invention.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Anton et al. (U.S. 6,005,023) in view of either Zhu (U.S. 5,889,083) or Nakamura et al. (U.S. 6,114,411).

The disclosure with respect to Anton et al. in paragraph 3 above is incorporated here by reference.

The difference between Anton et al. and the present claimed invention is the requirement in the claims of penetrating agent.

Zhu, which is drawn to ink jet inks, disclose the use of penetrating agent such as ethylene glycol ethyl ether in order to increase the solubility or dispersibility of resin or pigment present in the ink (col.8, lines 42-45 and 54-65).

Alternatively, Nakamura et al., which is drawn to ink jet inks, disclose the use of penetrating agent such as ethylene glycol ethyl ether in order to enhance anti-nozzle clogging properties, moisture resistance and/or dispersion stability of the ink (col.8, lines 51-57 and 64-68).

In light of the motivation for using penetrating agent disclosed by either Zhu or Nakamura et al. as described above, it therefore would have been obvious to one of ordinary skill

in the art to use such penetrating agent in the ink of Anton et al. in order to produce an ink with good pigment/resin dispersibility, or alternatively, to enhance anti-nozzle clogging properties, moisture resistance and/or dispersion stability, and thereby arrive at the claimed invention.

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhu (U.S. 5,889,083) or Anton et al. (U.S. 6,005,023) either of which in view of Ohta et al. (U.S. 5,954,866).

The disclosures with respect to Zhu and Anton et al. in paragraphs 2 and 3, respectively, are incorporated here by reference.

The difference between Zhu or Anton et al. and the present claimed invention is the requirement in the claims of sugar.

Ohta et al., which is drawn to ink jet inks, disclose the use of polysaccharide in order to impart moisture retention to ink as well as modify its viscosity (col.8, lines 22-27).

In light of the motivation for using polysaccharide disclosed by Ohta et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use polysaccharide in the ink of Zhu or Anton et al. in order to produce an ink with suitable viscosity and moisture retention, and thereby arrive at the claimed invention.

9. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhu (U.S. 5,889,083) or Anton et al. (U.S. 6,005,023) either of which in view of either Sacripante et al. (U.S. 6,329,446) or Cheng et al. (U.S. 6,239,193).

The disclosures with respect to Zhu and Anton et al. in paragraphs 2 and 3, respectively, are incorporated here by reference.

The difference between Zhu or Anton et al. and the present claimed invention is the requirement in the claims of volume average particle size of the pigment.

Zhu discloses the use of pigment that has average particle size of 0.01-1 μm while Anton et al. disclose the use of pigment that has average particle size of 0.1-0.3 μm , however, neither references discloses the volume average particle size of the pigment.

On the one hand, absent evidence to the contrary, it would have been natural for one of ordinary skill in the art to infer that the broad disclosure of average particle size by either Zhu or Anton et al. encompasses the volume average particle size as presently claimed, and thus, one of one of ordinary skill in the art would have arrived at the present invention.

On the other hand, Sacripante et al., which is drawn to ink jet inks, disclose the use of pigment with volume average particle size of 0.01-3 μm in order to prevent clogging of ink jet printer (col.6, lines 36-43).

Alternatively, Cheng et al., which is drawn to ink jet inks, disclose the use of pigment with volume average particle size of 0.01-1 μm wherein preferably at least 90% of the particles have size below 0.1 μm with no particles having size greater than 1 μm in order to prevent clogging of ink jet printer (col.12, lines 5-20).

In light of the motivation for using pigment with specific volume average particle size disclosed by either Sacripante et al. or Cheng et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such pigment in the ink of either Zhu or

Anton et al. in order to produce an ink which will not clog the printer nozzles, and thereby arrive at the claimed invention.

10. Claims 1-2, 5-8, and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al. (U.S. 6,274,646) in view of Ohta et al. (U.S. 5,954,866).

Watanabe et al. disclose ink jet ink comprising water, solvent, penetrating agent such as diethylene glycol monobutyl ether, surfactant, sugar, dispersant, and methyl methacrylate/butyl acrylate/acrylic acid random copolymer wherein the ratio of polymer to dispersant is 1:0.06 to 1:3. The ink is used in an ink jet printer in order to produce printed substrate (col.1, lines 7-10 and 40-60, col.2, lines 36 and 47, col.3, lines 5, 14, 25-30, and 32, col.3, line 65-col.4, line 21, and col.5, lines 23-25).

The difference between Watanabe et al. and the present claimed invention is the requirement in the claims of styrene-maleic anhydride.

Watanabe et al. disclose the use of dispersant such as styrene-maleic acid, however, there is no disclosure of styrene-maleic anhydride dispersant as presently claimed.

Ohta et al., which is drawn to ink jet inks, disclose the use of styrene-maleic anhydride dispersant in order to stably disperse pigment. Ohta et al. also disclose the equivalence and interchangeability of styrene-maleic anhydride dispersant, as presently claimed, with styrene-maleic acid dispersant as disclosed by Watanabe et al. (col.5, lines 30-31 and 59-61).

In light of the disclosure of Ohta et al. of the equivalence and interchangeability between styrene-maleic anhydride dispersant and styrene-maleic acid dispersant, it therefore would have

been obvious to one of ordinary skill in the art to use styrene-maleic anhydride dispersant in the ink of Watanabe et al., and thereby arrive at the claimed invention.

11. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al. in view of Ohta et al. as applied to claims 1-2, 5-8, and 10-11 above, and further in view of either Sacripante et al. (U.S. 6,329,446) or Cheng et al. (U.S. 6,239,193).

The difference between Watanabe et al. in view of Ohta et al. and the present claimed invention is the requirement in the claims of volume average particle size of the pigment.

Sacripante et al., which is drawn to ink jet inks, disclose the use of pigment with volume average particle size of 0.01-3 μm in order to prevent clogging of ink jet printer (col.6, lines 36-43).

Alternatively, Cheng et al., which is drawn to ink jet inks, disclose the use of pigment with volume average particle size of 0.01-1 μm wherein preferably at least 90% of the particles have size below 0.1 μm with no particles having size greater than 1 μm in order to prevent clogging of ink jet printer (col.12, lines 5-20).

In light of the motivation for using pigment with specific volume average particle size disclosed by either Sacripante et al. or Cheng et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such pigment in the ink of Watanabe et al. in order to produce an ink which will not clog the printer nozzles, and thereby arrive at the claimed invention.

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

EP 851014 disclose ink jet ink comprising polymer obtained from methyl methacrylate, butyl acrylate, and acrylic acid and dispersant which is a random copolymer. However, there is no disclosure of styrene-maleic anhydride as required in the present claims.

EP 622429 disclose ink comprising styrene-maleic anhydride, however, there is no disclosure of polymer obtained from methyl methacrylate, butyl acrylate, and acrylic acid as required in the present claims.

EP 985715 disclose ink jet ink comprising dispersant and binder, however, there is no disclosure that ink comprises polymer obtained from methyl methacrylate, butyl acrylate, and acrylic acid and styrene-maleic anhydride as required in the present claims.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 703-305-0208. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

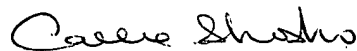
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 703-306-2777. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Callie E. Shosho
Examiner
Art Unit 1714

CS

1/13/03